

states that: "the sleeve is slightly oversized or larger than the outer diameter of the tip end portion of the shaft" and that "this arrangement provides radial spacing which allows the tip end of the shaft to rotate freely within the sleeve and without contacting the inner diameter surface of the sleeve during normal operation." It further states that excessive radial forces exerted on the shaft will cause the shaft to flex, bringing the outer diameter of the tip end portion into engagement with the inner diameter of the sleeve. Therefore, the amendments made in response to the prior Office Action dated March 15, 2001, did not add new matter to the application. Furthermore, the amendments do not raise issues that would require further search or consideration since claim 1 as originally filed recited that the drive shaft is nominally spaced from the annular sleeve. The present Amendment identifies the antecedent basis for the prior amendments in the application as originally filed. The present Amendment was not earlier presented because the Examiner did not previously assert that the shaft is not cantilevered. Entry of the present Amendment is requested. It is submitted that claims 1-7, 15-18 and 25-28 are now in suitable condition for allowance; notice of which is requested. Reconsideration of the Examiner's rejection is requested.

Claims 1-7, 15-18 and 25-28 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. The Examiner states that in claim 18 the limitation "the chamber" has insufficient antecedent basis. Claim 18 has been amended to traverse this rejection. The Examiner further states that the limitation "the aperture" in claim 27 lacks sufficient antecedent basis. Claim 27 has been amended to traverse the rejection. The amendments to claims 18 and 27 do not raise new issues that would require further search or consideration and do not add new matter to the application. The amendments were not earlier presented because the rejection was not previously raised by the Examiner. It is therefore submitted that the present Amendment should be entered and that the amendments place the claims in suitable condition for allowance; notice of which is requested.

Reconsideration of the Examiner's rejections is requested.

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Claim 6-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art in view of Mackay et al., U.S. Patent No. 5,485,044. The Examiner states that the Applicant's admitted prior art discloses a plastic thrust member operable to be in engagement with the end wall of the shaft to be installed to prevent axial movement of the shaft and that Mackay et al., discloses a thrust member within the bore of the housing to be in coaxial registry with the end wall of the shaft to be installed. The Examiner states it would have been obvious at the time the invention was made to modify the motor/gear drive of the Applicant's admitted prior art and provide it with the thrust member of Mackay et al., for the purpose of accurately controlling the end play of the armature shaft. It is submitted that neither the Applicant's admitted prior art nor Mackay et. al, taken singularly or in any permissible combination, teach or suggest the invention as recited in claim 6. In particular, neither reference discloses a plastic thrust member within the bore of a housing. On page 2, lines 10-25, the Applicant's specification states that: "axial end play of the gear shaft has been controlled by a threaded screw carrying a molded elastomer or resilient end cap." The screw is threaded into the tapped bore a sufficient distance to bring the end cap into engagement with the shaft. Therefore, the screw is within a bore and the molded elastomer or resilient end cap is not formed in situ within the bore. In addition, Mackay et al., teaches an insert 24 formed of brass material, not a plastic thrust member. ('044 patent, column 3, line 39). Therefore, neither of the references teach or suggest a plastic thrust member formed in situ within the bore of the housing as recited in claim 6. With respect to claim 7, the Examiner has stated that no patentable weight has been given to the limitation that the thrust member is an injection molded thrust member formed in situ. Claim 7 has been amended to structurally define the thrust member as an in situ injection molded thrust member as a structural limitation of the claim. Consideration of such structural limitation is requested. Furthermore, it is submitted that claim 7 is not a product by process claim as asserted by the Examiner and therefore the case of In re Thorpe, 227 U.S.P.Q. 964 (Fed. Cir. 1985), is inapplicable to claim 7. A more

applicable case to the language of claim 7 is In re Wilson, 165 U.S.P.Q. 494 (CCPA 1970), where the court stated: "all words in a claim must be considered in judging the patentability of that claim against the prior art." This guideline for claim interpretation is also stated in M.P.E.P. § 2143.03. It is submitted that the amendment to claim 7 does not raise new issues that would require further search or consideration and does not raise the issue of new matter since the limitation that the thrust member is an injection molded thrust member formed in situ was previously recited in the claims. The present Amendment simply restates the in situ limitation in a manner that is more clearly structural than functional. Entry of this Amendment is requested. Reconsideration of the Examiner's rejection is requested.

Claims 1-2, 4-5, 15-18 and 25-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Applicant's admitted prior art in view of Oyafuso, U.S. Patent No. 5,144,738, and further in view of Mackay et al., '044 patent. With respect to claim 1, the Examiner states that Oyafuso discloses a plastic annular sleeve within the bore of the housing concentrically disposed to be positionable about the outer diameter of the tip end portion of the shaft to be installed and to be nominally spaced radially from the outer diameter of the tip end portion. Claim 1 has been amended to recite that the sleeve is a plastic in situ molded annular sleeve as previously recited in claim 2. Claim 2 has been cancelled without prejudice. It is submitted that neither Oyafuso nor Mackay et al., teach or suggest the invention as now recited in claim 1. As discussed in greater detail above, Mackay et al., does not teach or suggest a plastic in situ molded sleeve and the addition of Oyafuso does not overcome this deficiency. It is submitted that Oyafuso does not teach a cantilevered shaft with a worm gear carried thereon. The shaft 12 of Oyafuso is radially supported by the thrust plug 14 at the tapered tip 13. (see '738 patent, column 4, lines 21-32 and lines 46-49.) With reference to claims 2, 5, 15, 17-18 and 25-26, the Examiner has stated that no patentable weight has been given to the structural limitation that the sleeve is formed in situ. As discussed in greater detail above, it is submitted that "all words in the claim must be considered in judging the

patentability of that claim against the prior art." M.P.E.P. § 2143.03. The amendment to claim 1 does not raise new issues that would require further search or consideration since the amendment adds the language of claim 2 into claim 1. The present Amendment does not raise new matter since the application as originally filed discloses and claims that the sleeve is formed in situ. The present Amendment was not earlier presented because the Oyafuso reference was not earlier cited or relied on by the Examiner in the prior Office Action and this is the Applicant's Attorney's first opportunity to review and address the relevance of the newly cited reference. Entry of this Amendment is requested. It is submitted that this Amendment traverses the rejection of the claims and places the claims in suitable condition for allowance and/or in better form for appeal. Reconsideration of the Examiner's rejection is requested.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the Applicant's admitted prior art in view of Oyafuso and further in view of Mackay et al., and further in view of Umezawa et al. As stated in greater detail above, the Examiner's reliance on Oyafuso does not teach or suggest a cantilevered shaft. Furthermore, as stated in greater detail above, neither Mackay et al., nor Umezawa et al., nor Oyafuso taken singularly or in any permissible combination, teach or suggest a plastic in situ molded sleeve. It is submitted that the present Amendment does not raise new issues requiring further search or consideration by the Examiner, nor does the present Amendment raise the issue of new matter because claim 3 has not been amended. The present Amendment was not earlier presented because the Oyafuso reference was not earlier cited or relied on by the Examiner in the prior Office Action and this is the Applicant's Attorney's first opportunity to review and address the relevance of the newly cited reference. Entry of this Amendment is requested. It is submitted that claim 3 is in suitable condition for allowance and/or in better form for appeal. Reconsideration of the Examiner's rejection is requested.

As set forth in the specification, bearings of the prior art have not been positionable within a motor/gear housing within desired tolerances to support a

cantilevered shaft only during deflection of the shaft under radial loads. In the prior art, the bearings supported the shaft continuously resulting in undesired noise and reduced efficiency. The present invention, on the other hand, teaches a process and apparatus for supporting the free end of a cantilevered shaft in a motor gear housing only during deflection of the free end of the shaft. The present invention overcomes the prior art problem of tolerance build-up of the several components in a motor/gear drive including the shaft, the bearing, and the housing of the motor/gear drive by separately injection molding in situ the radial bearing sleeve and the axial thrust bearing. None of the cited references taken singular, or in any permissible combination, teach or suggest this structure.

At best, the prior art references show components in bits and pieces of the inventive arrangement as claimed in the independent claims while none of the references show an in situ molded sleeve. The relevant art recognizes many components and concepts within its domain. Upon close investigation and scrutiny of the diverse practices in this art and its peripheral technical fields of endeavor, a fact-finder is inevitably led to the conclusion that artisans can and could produce a myriad of devices and functions of apparently endless diversity from components and concepts already individually recognized as belonging to the prior art. Such speculation must not cloud the standards for the evaluation of patentability over the prior art under 35 U.S.C. §§ 102 and 103. Properly focused, the issues center on what would have been anticipated, or obvious to one of ordinary skill in the art at the time of the invention. Obviousness is tested by what the combined teaching of the references would have suggested to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 425, 208 U.S.P.Q. 871, 881 (CCPA 1981). But it cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. See ACS Hosp. Sys. Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). And teachings of references can be combined only if there is some suggestion or incentive to do so. See In re FineI, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1599 (Fed. Cir. 1988). Approaches to obviousness determinations which focus

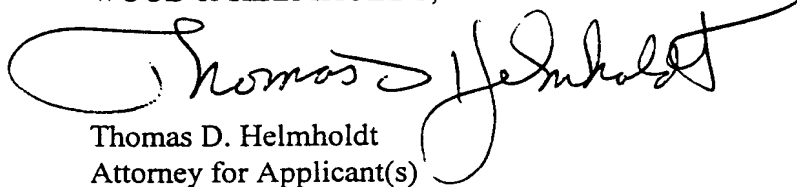
merely on identifying and tabulating missing elements in hindsight retrospect imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, and, fall victim to the insidious effect of hindsight syndrome wherein that which only the inventor taught is used against its teacher. *W. L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 312-3 (Fed. Cir. 1983). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 5 U.S.P.Q. 2d at 1600.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. In addition, it is submitted that the amendments to the claims do not raise new issues that would require further search or consideration. With respect to claims 1 and 2, claim 1 has been amended to include the language of claim 2 and claim 2 has been cancelled without prejudice. With respect to claim 7, the structural limitation of an in situ molded sleeve was already in the claims and the amendment restates the limitation in a manner that reinforces the assertion that the limitation is a structural limitation. Claims 18 and 27 have been amended to traverse rejections under 35 U.S.C. § 112. It is further submitted that the Amendment does not present additional claims without canceling a corresponding number of finally rejected claims. The amendments are deemed to place the application in a better form for appeal by materially reducing or simplifying the issues on appeal. In particular, the amendments to claim 1 and 7 simplify the issue on appeal as being, at least, whether the limitation that the sleeve is formed in situ is a structural limitation. Reconsideration of the application as amended is requested.

If the Examiner feels that the prosecution of the present application can be expedited by way of an Examiner's Amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

YOUNG, BASILE, HANLON, MacFARLANE,  
WOOD & HELMHOLDT, P.C.

A handwritten signature in black ink, appearing to read "Thomas D. Helmholdt", written over the printed name and title.

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TDH/RCM/p

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Replace the paragraphs starting on page 6, line 28 and ending on page 6, line 35 with:

Fig. 4 is a partial, cross-sectional view of the end of the gearbox housing, with the sleeve of the present invention mounted therein; [and]

Fig. 5 is a partial, cross-sectional view of the end portion of the gear housing shown in Fig. 4, with the gear shaft mounted therein, prior to the formation of the thrust bearing surface according to the present invention[.]; and

Figure 6 is a partial, cross-sectional view of the end portion of the gear housing shown in Figures 4 and 5, with the gear shaft mounted therein, showing a gap between the end portion and the sleeve.

Please replace the paragraph starting on page 8, line 28, and ending on page 9, line 5, with:

According to a unique feature of the present invention, the inner diameter of the sleeve 32 is slightly oversized or larger than the outer diameter of the tip end portion 16 of the shaft 10. This provides radial [a] spacing which allows the tip end 16 of the shaft 10 to freely rotate within the sleeve 32 and without contacting the inner diameter surface of the sleeve 32 during normal operation (as best seen in Figure 6). However, when excessive radial forces are exerted on the shaft 10, the tip end portion 16 of the shaft 10 will flex bringing the outer diameter of the tip end portion 16 into engagement with the inner diameter of the sleeve 32. The sleeve 32 resists further radial movement or deflection of the tip end 16 of the shaft 10 so as to support the shaft and reduce noise and friction during rotation of the shaft 10.

In the claims:



1. (Twice Amended) In a motor/gear drive having a cantilevered shaft with a worm gear carried thereon and a free tip end portion with an outer diameter terminating in an end wall, and a housing having a bore formed coaxial with respect to the shaft to be installed therein, the improvement comprising:

a plastic in situ molded annular sleeve within the bore of the housing concentrically disposed to be positionable about the outer diameter of the tip end portion of the shaft to be installed and to be nominally spaced radially from the outer diameter of the tip end portion, and wherein the sleeve is operable to supportingly engage the outer diameter of the tip end portion of the shaft only in response to radial loads acting to deflect the shaft into contact with the annular sleeve.

Cancel claim 2 without prejudice.

7. (Twice Amended) The improvement of claim 6, wherein the thrust member is an in situ injection molded thrust member [formed in situ within the bore of the housing].

18. (Amended) The motor/gear drive housing of claim 17 further comprising:

an injection molded plastic thrust member formed in situ within the at least one aperture of the housing, the thrust member disposed to be in coaxial registry with the end wall of the shaft to be installed, and operable to be engageable with the end wall of the shaft to be installed to prevent axial movement of the shaft, the outer diameter of the free tip end portion of the shaft to be installed being larger than a diameter of the thrust member engageable with the end wall of the free tip end portion of the shaft, the thrust member injection molded after installation of the shaft, wherein a portion of the end wall of the shaft defines at least a portion of [the] a chamber to receive injected plastic forming the thrust member during injection molding.

27. (Amended) The improvement of claim [1] 26 further comprising:

the aperture having a first portion of a first diameter and an axially endmost, coaxial, second portion of a smaller diameter, a shoulder formed between the first and second portions, and a first gate formed in the housing communicating with the first portion.

In the drawings:

New proposed Figure 6 is submitted with a Request for Drawing Change Approval in response to the Examiner's objection to the drawings.